

iSQAPER PhD Student Research Information

Research Title

Factors and mechanisms of chemical N fertilizers combined with organic materials ameliorate acidification of red soils under long-term field experiments, South China

Abstract

Soil acidification from chemical N fertilizers is one of the main factors limiting crop growth in southern China. In our previous study, we found that urea combined with manure could effectively reduce soil acidification rate, increase soil quality, and maintain crop yields as compared with other fertilization modes during a 26-year field experiment. But there is little information on their mechanisms. My hypothesis is that chemical N fertilizers combined with organic materials could reduce soil N transformation rate and increase N use efficiency through changing C/N ratio of fertilizers, increase soil pH buffering capacity, and therefore reduce net proton amount of production from added N fertilizer and soil acidification rate. So, in my research short-term field experiments and lab incubation experiments will be also conducted to investigate the effects of different crop residues and manures at different rates and C/N ration on soil N transformation rate, N lost by gaseous or leaching, and acidification rates and net proton amount will be calculated.

Objectives of the research

The objectives of this research is to investigate chemical N fertilizer combined with different organic materials with different chemical properties on N transformation, N use efficiency and soil acidity, and thus evaluate the potential mechanisms of chemical N fertilizer combined with organic materials ameliorating soil acidification.

iSQAPER Study Site / Work Package

Beijing, China/Soil quality indices and Long-term experiments.

Partners in this research

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